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Re: Application of Takahide ISHIKAWA and Katsuhiko ITO
TERMINATION SIGNAL DECIDING DEVICE AND UNINTERRUPTIBLE POWER SUPPLY SYSTEM EQUIPPED WITH THE TERMINATION SIGNAL DECIDING DEVICE
Assignee: MITSUBISHI DENKI KABUSHIKI KAISHA
Our Ref: Q69009

Dear Sir:

The following documents and fees are submitted herewith in connection with the above application for the purpose of entering the National stage under 35 U.S.C. § 371 and in accordance with Chapter I of the Patent Cooperation Treaty:

☑ an executed Declaration and Power of Attorney.

☑ an English translation of the International Application.

☑ six (6) sheets of drawings.

☑ an executed Assignment and PTO 1595 form.

☑ an Information Disclosure Statement and PTO Form 1449 with a reference.

It is assumed that copies of the International Application, the International Search Report, the International Preliminary Examination Report, and any Articles 19 and 34 amendments as required by § 371(c) will be supplied directly by the International Bureau, but if further copies are needed, the undersigned can easily provide them upon request.

The Government filing fee is calculated as follows:

Total claims	6	-	20	=		x $18.00	= $.00
Independent claims	3	-	3	=		x $84.00	= $.00
Base Fee							$890.00
Multiple Dependent Claim Fee							$280.00
TOTAL FILING FEE							$1170.00
Recordation of Assignment							$ 40.00
TOTAL FEE							$1210.00

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Checks for the statutory filing fee of $1170.00 and Assignment recordation fee of $40.00 are attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No. 19-4880. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.492 which may be required during the entire pendency of the application to Deposit Account No. 19-4880. A duplicate copy of this transmittal letter is attached.

Respectfully submitted,

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Description

TERMINATION SIGNAL DECIDING DEVICE AND UNINTERRUPTIBLE POWER SUPPLY SYSTEM EQUIPPED WITH THE TERMINATION SIGNAL DECIDING DEVICE

Technical Field

The present invention relates to a termination signal deciding device for receiving/deciding a termination signal, which is transmitted after the termination process is ended at the time of power failure, from a plurality of equipments, to which the power is supplied from the uninterruptible power supply system, so as to output a termination command and an uninterruptible power supply system equipped with this termination signal deciding device.

Background Art

In the prior art, one uninterruptible power supply system is employed in one equipment such as the computer that needs the backup at the time of power failure. However, as the number of the equipments to which the backup should be provided is increased, plural equipments are connected to one uninterruptible power supply system.

FIG.5 is a view showing a configuration of an uninterruptible power supply system as the conventional example. In FIG.5, 50 is a commercial power supply system, 51 is an

uninterruptible power supply system, and 52, 53 are equipments to which the power is supplied from the uninterruptible power supply system 51. Also, 60 is a converter portion for converting the AC power (the commercial power supply system 50) into the DC power, 61 is an inverter portion for converting the DC power into the AC power, 62 is a battery, 63 is a booster circuit for boosting the voltage of the battery 62, 64 is a control portion, 65 is an output control portion, and 66 is an output plug socket. Also, 67 is a battery drive signal output terminal for outputting a battery-drive informing signal (referred to as a "battery drive signal" hereinafter) to the equipments 52, 53, to which the power is supplied, at the time of power failure, and 68 is a termination signal input terminal for receiving a termination signal that is transmitted from the equipments 52, 53 after the termination process is ended at the time of power failure. Also, 70 is a power line for supplying the power to the equipments 52, 53, 71 is a battery-drive signal line for transmitting the battery drive signal, and 72 is a termination signal line for transmitting a termination signal.

An operation of the uninterruptible power supply system in the prior art will be explained hereunder.

The control portion 64 detects a voltage waveform of the commercial power supply system 50 to decide that the commercial power supply system 50 is normal or abnormal. When the commercial power supply system is normal, the AC power (the

commercial power supply system 50) is converted into the DC power by the converter portion 60, then the DC power is converted into the AC power by the inverter portion 61, and then the AC power is supplied to the equipments 52, 53. Also, the battery 62 is charged by the booster circuit 63 by using the DC power that is converted by the converter portion 60.

In the power failure, the voltage of the battery 62 is boosted by the booster circuit 63, then the DC power is converted into the AC power by the inverter portion 61, and then the AC power is supplied to the equipments 52, 53. Also, in the power failure, the control portion 64 switches the DC power that is converted by the converter portion 60 to the battery 62 and also transmits the battery drive signal to the equipments 52, 53 to which the power is supplied.

When the equipments 52, 53, to which the power is supplied from the uninterruptible power supply system 51, receive the battery drive signal, they carry out the termination process such as the OS shutdown, etc. respectively. When the equipment 53 to which the termination signal line 72 is connected ends the termination process, it transmits the termination signal to the uninterruptible power supply system 51.

If the control portion 64 receives the termination signal from the equipment 53, it shifts to the termination operation and causes the output control portion 65 to execute the output control and to stop the power-supply to the equipments 52, 53.

In the prior art, the termination signal input terminal 68 of the uninterruptible power supply system 51 is provided to one location. Therefore, if a plurality of equipments (equipments 52, 53 in FIG.5) are connected to one uninterruptible power supply system 51, the equipment that can output the termination signal to the uninterruptible power supply system 51 must be selected. In FIG.5, there is shown the example in which the equipment 53 is selected as the equipment that can output the termination signal.

FIG.6 is a view showing another configuration of an uninterruptible power supply system as the conventional example. In FIG.6, 50 to 53, 60 to 68, 70 to 72 are similar to those in FIG.5 and thus their explanation will be omitted hereunder. Also, 54 is a termination signal selecting unit for receiving a plurality of termination signals and then selecting the termination signal that is to be output to the uninterruptible power supply system 51.

In above FIG.5, there is shown the example in which the equipment 53 is selected as the equipment, that can output the termination signal, from a plurality of equipments 52, 53, to which the power is supplied from the uninterruptible power supply system 51, and then the termination signal line 72 that transmit the termination signal is connected to the equipment 53. In contrast, in FIG.6, the termination signals supplied from a plurality of equipments, that are connected to the

uninterruptible power supply system 51, are received once by the termination signal selecting unit 54, then the termination signal is selected from the termination signals supplied from a plurality of equipments, and then the selected termination signal is output to the uninterruptible power supply system 51.

As described above, the termination signal input terminal 68 of the uninterruptible power supply system in the prior art is provided to one location. Therefore, if the power is supplied to a plurality of equipments (equipments 52, 53 in FIG.6) from one uninterruptible power supply system 51, the termination signals supplied from the equipments to which the power is supplied must be selected. In case the power-supply is stopped based on the termination signal supplied from the equipment whose time required for the termination process (referred to as a "termination process time" hereinafter) is long, a time required to start the battery drive after the power failure becomes long. As a result, there is the problem that the battery capacity must be increased. Also, if the power-supply is stopped based on the termination signal supplied from the equipment that has the short termination process time with regard to the battery capacity, there is the problem that the power-supply to the equipments having the termination process time that is longer than that of the equipment whose termination signal is selected is cut off in the middle of the execution

of the termination process.

In addition, there are the problems that, as the number of the equipments to which the power is supplied from the uninterruptible power supply system is increased, the operation for selecting the equipment that can output the termination signal becomes troublesome, and also the wiring operation becomes complicated when the equipments that can output the termination signal are to be changed.

The present invention has been made to overcome above subjects, and it is a first object to get a termination signal deciding device and an uninterruptible power supply system, which are capable of receiving the termination signal, which is transmitted after the termination process is ended at the time of power failure, from a plurality of equipments to which the power is supplied from an uninterruptible power supply system, and then selecting a power-supply stopping timing at the time of power failure in response to the type of the equipment as the backup object.

Also, it is a second object to get a termination signal deciding device and an uninterruptible power supply system, which are capable of selecting the power-supply stopping timing in response to a backup time that is decided based on a battery capacity, a consumption power of the equipment as the backup object, etc.

In addition, it is a third object to get an uninterruptible power supply system which is capable of effectively employing the battery at the time of battery drive.

Disclosure of the Invention

A termination signal deciding device of the present invention comprises at least two termination signal input terminals for receiving termination signals that are transmitted from equipments, to which a power is supplied from an uninterruptible power supply system, after a termination process has been ended at a time of power failure; a first termination command outputting means for receiving the termination signals from all equipments to which the power is supplied from the uninterruptible power supply system and then outputting the termination command; a second termination command outputting means for receiving a termination signal from any of the equipments to which the power is supplied from the uninterruptible power supply system and then outputting the termination command; a setting switch for selecting any one of the first termination command outputting means and the second termination command outputting means; and a switching circuit for switching the first termination command outputting means and the second termination command outputting means based on selection of the setting switch.

Also, the first termination command outputting means

consists of a first selecting switch for selecting the termination signal used in decision, and the second termination command outputting means consists of a second selecting switch for selecting the termination signal used in decision.

Also, an uninterruptible power supply system of the present invention to which at least two objective equipments that receive a power-supply are connected, comprises at least two termination signal input terminals for receiving termination signals that are transmitted from these equipments after a termination process has been ended at a time of power failure; a first termination command outputting means for receiving the termination signals from all objective equipments to which the power is supplied and then outputting a termination command; a second termination command outputting means for receiving a termination signal from any of the objective equipments to which the power is supplied and then outputting the termination command; a setting switch for selecting any one of the first termination command outputting means and the second termination command outputting means; and a switching circuit for switching the first termination command outputting means and the second termination command outputting means based on selection of the setting switch; wherein a power-supply to the equipments is stopped if the termination command from the first termination command outputting means or the second termination command outputting means being

selected by the setting switch is input.

In addition, an uninterruptible power supply system of the present invention to which at least two objective equipments that receive a power-supply are connected, comprises at least two sets of a termination signal deciding means and an output plug socket, the termination signal deciding means including termination signal input terminals for receiving termination signals that are transmitted from the equipments after a termination process has been ended at a time of power failure, a first termination command outputting means for receiving the termination signals from all objective equipments to which the power is supplied and then outputting a termination command, a second termination command outputting means for receiving a termination signal from any of the objective equipments to which the power is supplied and then outputting the termination command, a setting switch for selecting any one of the first termination command outputting means and the second termination command outputting means, and a switching circuit for switching the first termination command outputting means and the second termination command outputting means based on selection of the setting switch; a control portion that shifts to a termination operation based on the termination signal that is output from the termination signal deciding means; and an output control portion for controlling an output to the output plug socket based on the termination command from the control portion;

wherein a power-supply is stopped every equipment that is connected to the termination signal deciding means which outputs the termination command.

Further, the first termination command outputting means consists of a first selecting switch for selecting the termination signal used in decision, and the second termination command outputting means consists of a second selecting switch for selecting the termination signal used in decision.

Brief Description of the Drawings

FIG.1 is a view showing a configuration of an uninterruptible power supply system according to an embodiment 1 of the present invention.

FIG.2 is a view showing a configuration of an uninterruptible power supply system according to an embodiment 2 of the present invention.

FIG.3 is a view showing a configuration of an uninterruptible power supply system according to an embodiment 3 of the present invention.

FIG.4 is a view showing a configuration of an uninterruptible power supply system according to an embodiment 4 of the present invention.

FIG.5 is a view showing a configuration of an uninterruptible power supply system as the conventional example.

FIG.6 is a view showing another configuration of an uninterruptible power supply system as the conventional example.

Best Modes for Carrying Out the Invention

Embodiment 1

FIG.1 is a view showing a configuration of an uninterruptible power supply system according to an embodiment 1 of the present invention. In FIG.1, 50, 60 to 65, 67, 70 to 72 are similar to those in FIG.5 in the prior art and thus their explanation will be omitted hereunder. Also, 1a is an uninterruptible power supply system; 2a is an AND circuit as a first termination command outputting means for outputting the termination command after it receives the termination signals from all objective equipments 20 (20a, 20b, 20c, 20d) to which the uninterruptible power supply system 1a supplies the power; 3a is an OR circuit as a second termination command outputting means for outputting the termination command after it receives the termination signal from any of the equipments 20 (20a, 20b, 20c, 20d); 4a is a setting switch for selecting the AND circuit 2a or the OR circuit 3a; and 5a is a switching circuit for switching the circuit that processes the termination signal (the AND circuit 2a or the OR circuit 3a). Also, 6 is an output plug socket for supplying the power to the equipments 20 (20a, 20b, 20c, 20d); and 7 (7a, 7b, 7c, 7d) are termination

signal input terminals for receiving the termination signal from the equipments 20 (20a, 20b, 20c, 20d).

An operation of the uninterruptible power supply system 1a in the embodiment 1 will be explained hereunder.

When the commercial power supply system is normal, the AC power (the commercial power supply system 50) is converted into the DC power by the converter portion 60, then the DC power is converted into the AC power by the inverter portion 61, and then the AC power is supplied to the equipments 20 (20a, 20b, 20c, 20d). Also, the battery 62 is charged by the DC power that is converted by the converter portion 60.

In the power failure, the DC power that is obtained by boosting the voltage of the battery 62 by means of the booster circuit 63 is converted into the AC power by the inverter portion 61, and then the AC power is supplied to the equipments 20 (20a, 20b, 20c, 20d). Also, in the power failure, the control portion 64 switches the DC power that is supplied to the inverter portion 61 from the DC power, that is converted by the converter portion 60, to the battery 62 and also transmits the battery drive signal indicating the battery drive to the equipments 20 (20a, 20b, 20c, 20d) to which the power-supply is applied.

When the equipments 20 (20a, 20b, 20c, 20d) receive the battery drive signal, they decide that the power failure is caused, then execute the termination process such as the OS shutdown, etc., and then send out the termination signal after

the termination process is ended.

When the AND circuit 2a and the OR circuit 3a process the termination signals that are input to the termination signal input terminals 7 (7a, 7b, 7c, 7d) from the equipments 20 (20a, 20b, 20c, 20d) to confirm that the termination process of the connected equipment has been ended, they decide that the equipment is ready for the power-supply stop and then output the termination command.

When the control portion 64 receives the termination signal from the selected termination command outputting means (the termination command outputting means, that is connected via the switching circuit 5a, out of the AND circuit 2a and the OR circuit 3a), it shifts to the termination operation.

The output control portion 65 executes the output control and then stops the power-supply to the equipments 20 (20a, 20b, 20c, 20d) from the output plug socket 6.

In above FIG.1, there is explained the example in which the AND circuit 2a, the OR circuit 3a, the setting switch 4a, the switching circuit 5a, and the termination signal input terminals 7 (7a, 7b, 7c, 7d) are built in the uninterruptible power supply system 1a. In this case, as the separate example, the termination command that is decided by the termination command outputting means may be output to the termination signal input terminal of the uninterruptible power supply system in the prior art.

In the embodiment 1, the AND circuit 2a that can output the termination command after it receives the termination signals from all the equipments 20 (20a, 20b, 20c, 20d) to which the power is supplied from the uninterruptible power supply system 1a and the OR circuit 3a that can output the termination command after it receives the termination signal from any one of the equipments 20 (20a, 20b, 20c, 20d) to which the power is supplied from the uninterruptible power supply system 1a are provided, whereby the AND circuit 2a and the OR circuit 3a can be switched in operation. Therefore, in response to the type of the equipment as the backup object, the power-supply stopping timing at the time of power failure can be selected such that the power-supply may be stopped after all the equipments 20 (20a, 20b, 20c, 20d) as the objects to which the uninterruptible power supply system 1a supplies the power have ended the termination process at the time of power failure, otherwise the power- supply may be stopped quickly at the time of power failure.

Embodiment 2

FIG.2 is a view showing a configuration of an uninterruptible power supply system according to an embodiment 2 of the present invention. In FIG.2, 6, 7 (7a, 7b, 7c, 7d), 20 (20a, 20b, 20c, 20d), 50, 60 to 65, 67, 70 to 72 are similar to those in FIG.1 and thus their explanation will be omitted

hereunder. Also, 1b is an uninterruptible power supply system; 2b is an AND circuit as a first termination command outputting means; 3b is an OR circuit as a second termination command outputting means; 4b is a setting switch for selecting the AND circuit 2b or the OR circuit 3b; 5b is a switching circuit for switching the circuit whose termination signal is processed (the AND circuit 2b or the OR circuit 3b); 8a is a first validity/invalidity selecting switch for selecting the validity/invalidity of the termination signal that is transmitted to the AND circuit 2b from the equipments 20 (20a, 20b, 20c, 20d); and 8b is a second validity/invalidity selecting switch for selecting validity/invalidity of the termination signal that is transmitted to the OR circuit 3b from the equipments 20 (20a, 20b, 20c, 20d).

In the embodiment 2, the AND circuit 2b and the OR circuit 3b are constructed by adding the circuit, that selects the validity/invalidity of the termination signal that is transmitted from the equipments 20 (20a, 20b, 20c, 20d), to the AND circuit 2a and the OR circuit 3a in FIG.1 respectively such that the termination signal transmitted from the equipments 20 (20a, 20b, 20c, 20d) can be selected in operation by the validity/invalidity selecting switches 8 (8a, 8b).

In the embodiment 2, the validity/invalidity selecting switches 8 (8a, 8b) for selecting the validity/ invalidity of the termination signal transmitted from the equipments 20 (20a,

20b, 20c, 20d) are provided. Therefore, only the termination signal of the equipment, that is necessary to decide whether or not the power-supply stop is right, out of the equipments 20 (20a, 20b, 20c, 20d) to which the power is supplied from the uninterruptible power supply system 1b can be selectively employed, and also the power-supply stop can be selected in response to the backup time that is decided based on the capacity of the battery 62, the consumption power of the equipment as the backup object, etc.

Embodiment 3

FIG.3 is a view showing a configuration of an uninterruptible power supply system according to an embodiment 3 of the present invention. In FIG.3, 6, 20 (20a, 20b, 20c, 20d), 50, 60 to 65, 67, 70 to 72 are similar to those in FIG.2 and thus their explanation will be omitted hereunder. Also, 1c is an uninterruptible power supply system; 7e is a termination signal input terminal for receiving the termination signal; 21 is a termination signal deciding device; 22 is a battery drive signal output terminal; and 23 (23a, 23b, 23c, 23d) are termination signal input terminals of the termination signal deciding device 21 for receiving the termination signal.

In above embodiment 2, there is shown the example in which the AND circuit 2b, the OR circuit 3b, the setting switch 4b, the switching circuit 5b, the termination signal input terminals

7 (7a, 7b, 7c, 7d), the first validity/invalidity selecting switch 8a, and the second validity/invalidity selecting switch 8b are built in the uninterruptible power supply system 1b. In the embodiment 3, a means for deciding the termination signals that are transmitted from the equipments 20 (20a, 20b, 20c, 20d) is separated as the termination signal deciding device 21, and then the termination command as the decision result of a plurality of termination signals is output to the uninterruptible power supply system.

In the embodiment 3, a function of deciding the termination signals that are transmitted from the equipments 20 (20a, 20b, 20c, 20d) is separated as the termination signal deciding device 21, and then the termination command as the decision result of a plurality of termination signals is output to the uninterruptible power supply system. Therefore, the conventional type uninterruptible power supply system can be employed, and thus the uninterruptible power supply system in the embodiment 3 can easily respond to the increase of the equipments to which the uninterruptible power supply system supplies the power.

Embodiment 4

FIG.4 is a view showing a configuration of an uninterruptible power supply system according to an embodiment 4 of the present invention. In FIG.4, 2b, 3b, 8a, 8b, 20 (20a,

20b, 20c, 20d), 50, 60 to 63, 67, 70 to 72 are similar to those in FIG.2 and thus their explanation will be omitted hereunder. Also, 1d is an uninterruptible power supply system; 4c is a setting switch for selecting the AND circuit 2b or the OR circuit 3b in response to the system; 5c is a switching circuit for switching the termination command outputting means (the AND circuit 2b or the OR circuit 3b) in response to the system; 7 (7a1, 7a2, 7b1, 7b2, 7c1, 7c2, 7d1, 7d2) are termination signal input terminals for receiving the termination signals from the equipments 20 (20a, 20b, 20c, 20d); 10 is a control portion; 11 is an output control portion for executing the output control in response to the system; 12 is an output plug socket for the system 1; 13 is an output plug socket for the system 2; 14 is a termination command outputting means for the system 1; and 15 is a termination command outputting means for the system 2.

In the above embodiment 2 shown in FIG.2, there is shown the example in which one set of the AND circuit 2b, the OR circuit 3b, the first validity/invalidity selecting switch 8a, and the second validity/invalidity selecting switch 8b is provided. In the embodiment 4 shown in FIG.4, two sets of the AND circuit 2b, the OR circuit 3b, the first validity/invalidity selecting switch 8a, and the second validity/invalidity selecting switch 8b are provided in response to two systems, and also the output control portion 11 for executing the output control in response

to two systems is provided.

An operation of the uninterruptible power supply system 1d in the embodiment 4 will be explained hereunder.

The control portion 10 detects the voltage waveform of the commercial power supply system 50 to decide that the commercial power supply system 50 is normal or abnormal.

If the commercial power supply system is normal, the AC power (the commercial power supply system 50) is converted into the DC power by the converter portion 60, then the DC power is converted into the AC power by the inverter portion 61, and then the AC power is supplied to the equipments 20 (20a, 20b, 20c, 20d). In this case, the power is supplied to the equipments 20a, 20b out of the equipments 20 (20a, 20b, 20c, 20d), to which the uninterruptible power supply system 1d supplies the power, as the system 1 via the output plug socket 12 for the system 1, whereas the power is supplied to the equipments 20c, 20d as the system 2 via the output plug socket 13 for the system 2. Also, the battery 62 is charged by the booster circuit 63 by using the DC power that is converted by the converter portion 60.

At the time of power failure, the voltage of the battery 62 is boosted by the booster circuit 63, then the DC power is converted into the AC power by the inverter portion 61, and then the AC power is supplied to the equipments 20 (20a, 20b, 20c, 20d). Also, at the time of power failure, the control

portion 10 switches the DC power, that is converted by the converter portion 60, into the battery 62, and also transmits the battery drive signal to the equipments 20 (20a, 20b, 20c, 20d) to which the power is supplied.

After the equipments 20 (20a, 20b, 20c, 20d) have received the battery drive signal, they execute the termination process respectively and then send out the termination signal after the termination process is ended.

The termination command outputting means 14 for the system 1 executes the decision process to the termination signals of the equipments 20a, 20b assigned to the system 1 to confirm that the termination process of the connected equipments is ended, then decides that the connected equipments are ready for the power-supply stop, and then outputs the termination command to the control portion 10. Also, the termination command outputting means 15 for the system 2 executes the decision process to the termination signals of the equipments 20c, 20d assigned to the system 2 to confirmed that the termination process of the connected equipments is ended, then decides that the equipments are ready for the power-supply stop, and then outputs the termination command to the control portion 10.

The control portion 10 decides in response to the system whether or not the power-supply stop is right, then shifts to the termination operation of the system if there is the concerned

system that is ready for the power-supply stop, and then outputs the termination command to the output control portion 11.

The output control portion 11 carries out the output control in response to the system based on the command issued from the control portion 10, and then stops the power-supply every system that is ready for the power-supply stop. For example, if the system 1 is ready for the power-supply stop, the power-supply to the equipments 20a, 20b assigned to the system 1 via the output plug socket 12 for the system 1 is stopped, but the power-supply is continued only to the equipments 20c, 20d assigned to the system 2. If the system 2 is ready for the power-supply stop, the power-supply to the equipments 20c, 20d assigned to the system 2 via the output plug socket 13 for the system 2 is stopped.

In the embodiment 4, two sets of the AND circuit 2b, the OR circuit 3b, and the validity/invalidity selecting switches 8 (8a, 8b) are provided in the two system-responsive manner, and also the output control portion 11 for executing the output control in the two-system responsive manner is provided. When the power failure is caused, the uninterruptible power supply system can apply the battery drive to the equipments 20a, 20b assigned to the system 1 and the equipments 20c, 20d assigned to the system 2, but the power-supply can be stopped every system that is ready for the power-supply stop. As a result, the backup time for the equipments as the object of the battery drive can

be extended.

In the above, there is shown the example in which two sets of the AND circuit 2b, the OR circuit 3b, and the validity/invalidity selecting switches 8 (8a, 8b) are provided in the two system-responsive manner, and also the output control portion 11 for executing the output control in the two system-responsive manner is provided. In this case, the number of systems may be increased and the power- supply may be stopped sequentially every system that is ready for the power-supply stop.

Industrial Applicability

As described above, the uninterruptible power supply system according to the present invention is suitable for the situation that the objective equipments to which the power is supplied are employed in plural systems.

CLAIMS

1. A termination signal deciding device comprising:

at least two termination signal input terminals for receiving termination signals that are transmitted from equipments, to which a power is supplied from an uninterruptible power supply system, after a termination process has been ended at a time of power failure;

a first termination command outputting means for receiving the termination signals from all equipments to which the power is supplied from the uninterruptible power supply system and then outputting the termination command;

a second termination command outputting means for receiving a termination signal from any of the equipments to which the power is supplied from the uninterruptible power supply system and then outputting the termination command;

a setting switch for selecting any one of the first termination command outputting means and the second termination command outputting means; and

a switching circuit for switching the first termination command outputting means and the second termination command outputting means based on selection of the setting switch.

2. A termination signal deciding device according to claim 1, wherein the first termination command outputting means consists of a first selecting switch for selecting the termination signal used in decision, and the second termination

command outputting means consists of a second selecting switch for selecting the termination signal used in decision.

3. An uninterruptible power supply system to which at least two objective equipments that receive a power-supply are connected, comprising:

at least two termination signal input terminals for receiving termination signals that are transmitted from these equipments after a termination process has been ended at a time of power failure;

a first termination command outputting means for receiving the termination signals from all objective equipments to which the power is supplied and then outputting a termination command;

a second termination command outputting means for receiving a termination signal from any of the objective equipments to which the power is supplied and then outputting the termination command;

a setting switch for selecting any one of the first termination command outputting means and the second termination command outputting means; and

a switching circuit for switching the first termination command outputting means and the second termination command outputting means based on selection of the setting switch;

wherein, if the termination command from the first termination command outputting means or the second termination

command outputting means being selected by the setting switch is input, a power-supply to the equipments is stopped.

4. An uninterruptible power supply system to which at least two objective equipments that receive a power-supply are connected, comprising:

at least two sets of a termination signal deciding means and an output plug socket, the termination signal deciding means including

termination signal input terminals for receiving termination signals that are transmitted from the equipments after a termination process has been ended at a time of power failure,

a first termination command outputting means for receiving the termination signals from all objective equipments to which the power is supplied and then outputting a termination command,

a second termination command outputting means for receiving a termination signal from any of the objective equipments to which the power is supplied and then outputting the termination command,

a setting switch for selecting any one of the first termination command outputting means and the second termination command outputting means, and

a switching circuit for switching the first termination command outputting means and the second termination

command outputting means based on selection of the setting switch;

a control portion that shifts to a termination operation based on the termination signal that is output from the termination signal deciding means; and

an output control portion for controlling an output to the output plug socket based on the termination command from the control portion;

wherein a power-supply is stopped every equipment that is connected to the termination signal deciding means which outputs the termination command.

5. An uninterruptible power supply system according to claim 3 or claim 4, wherein the first termination command outputting means consists of a first selecting switch for selecting the termination signal used in decision, and the second termination command outputting means consists of a second selecting switch for selecting the termination signal used in decision.

ABSTRACT

There are provided at least two termination signal input terminals 7a, 7b, 7c, 7d for receiving termination signals that are transmitted from objective equipments 20a, 20b, 20c, 20d, to which a power is supplied, after a termination process has been ended at the time of power failure, an AND circuit 2a for receiving termination signals from all the objective equipments 20a, 20b, 20c, 20d to which the power is supplied from the uninterruptible power supply system and then outputting the termination command, an OR circuit 3a for receiving the termination signal from any of the objective equipments to which the power is supplied and then outputting the termination command, and a switching circuit 5a for switching the AND circuit 2a and the OR circuit 3a based on selection of a setting switch 4a that selects any one of the AND circuit 2a and the OR circuit 3a.

FIG. 1

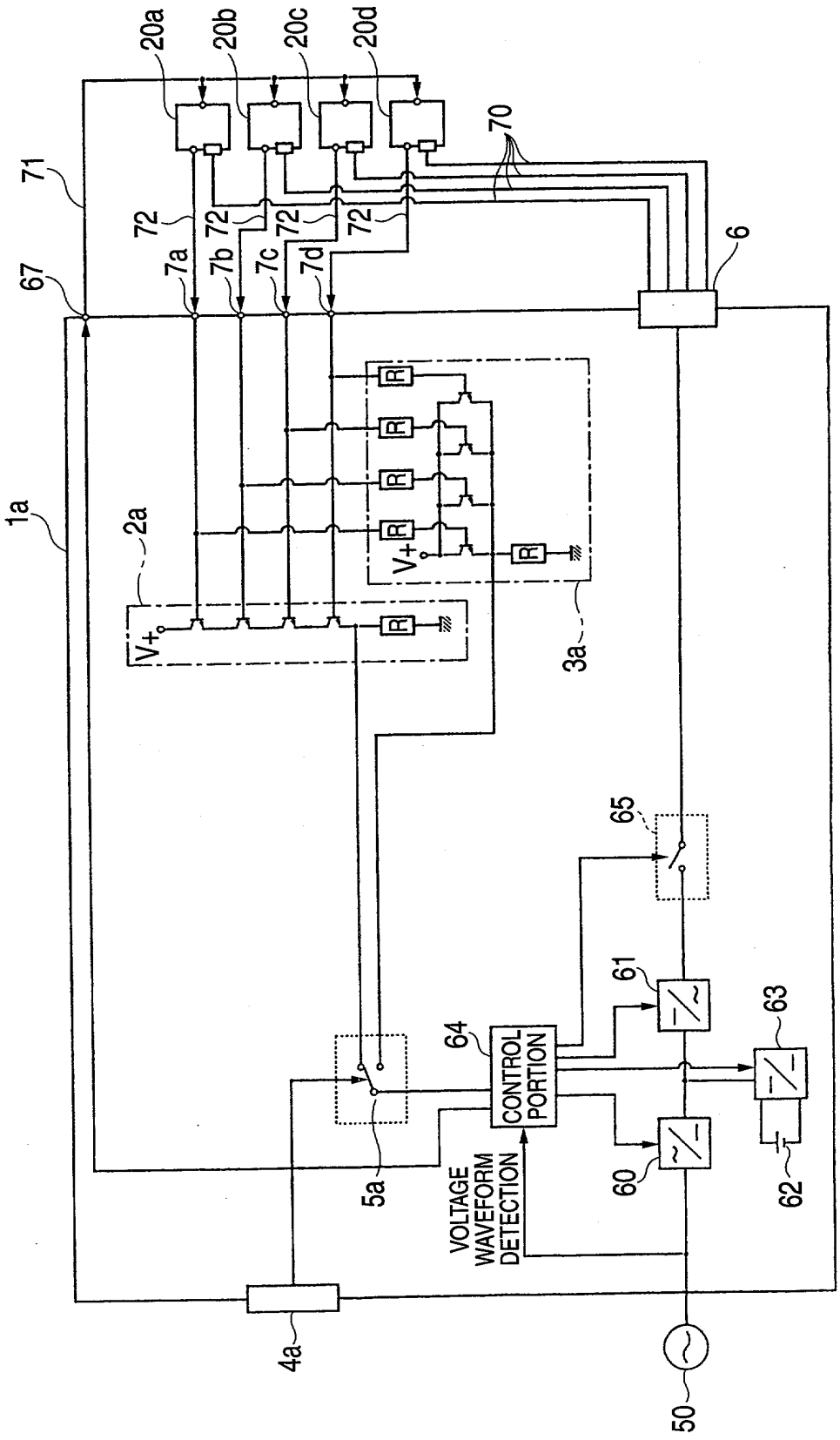

20a
20b
20c
20d
70
71
72
7a
7b
7c
7d
67
6
1a
2a
V+
R
3a
65
61
63
64
CONTROL PORTION
5a
VOLTAGE WAVEFORM DETECTION
60
62
4a
50

FIG. 2

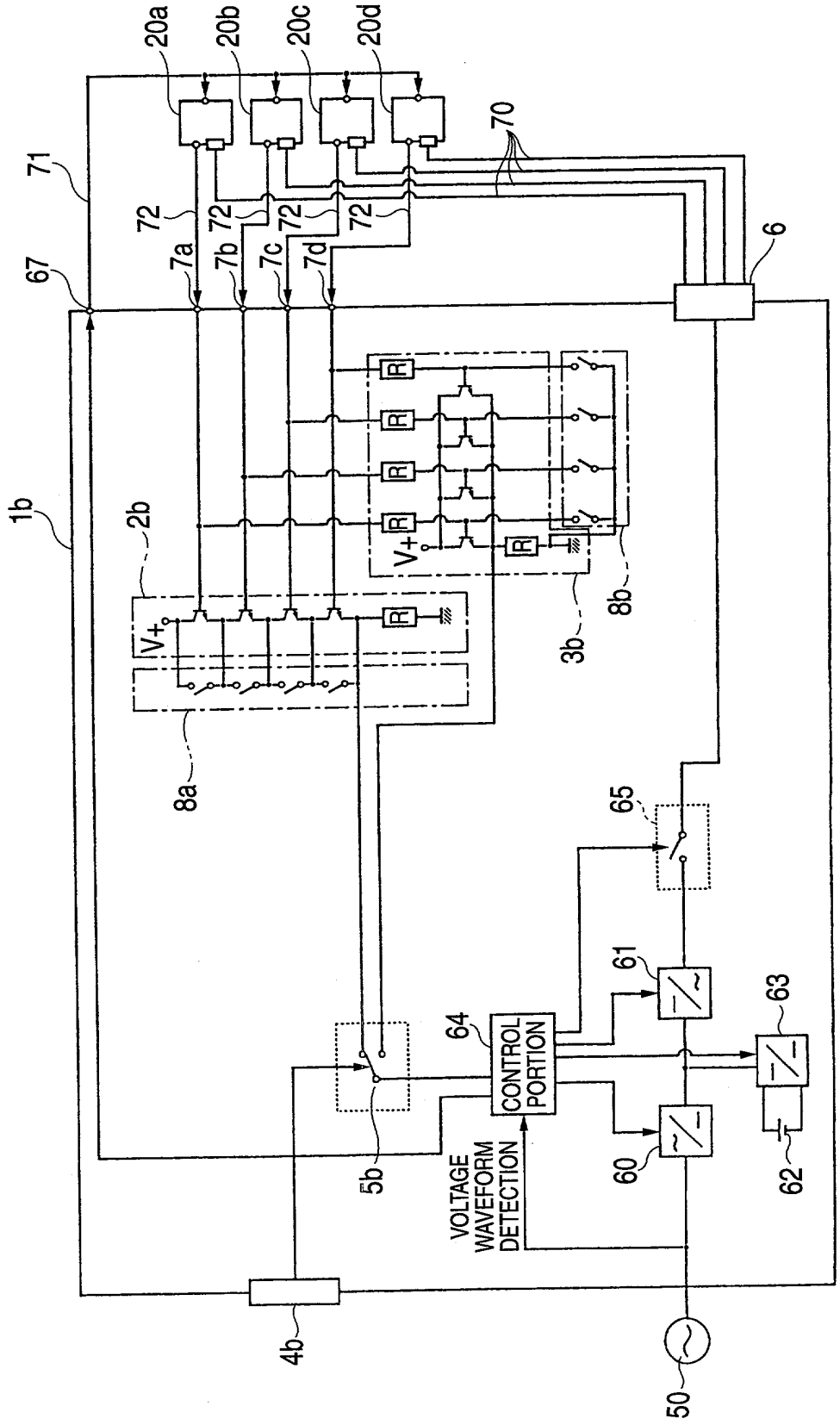
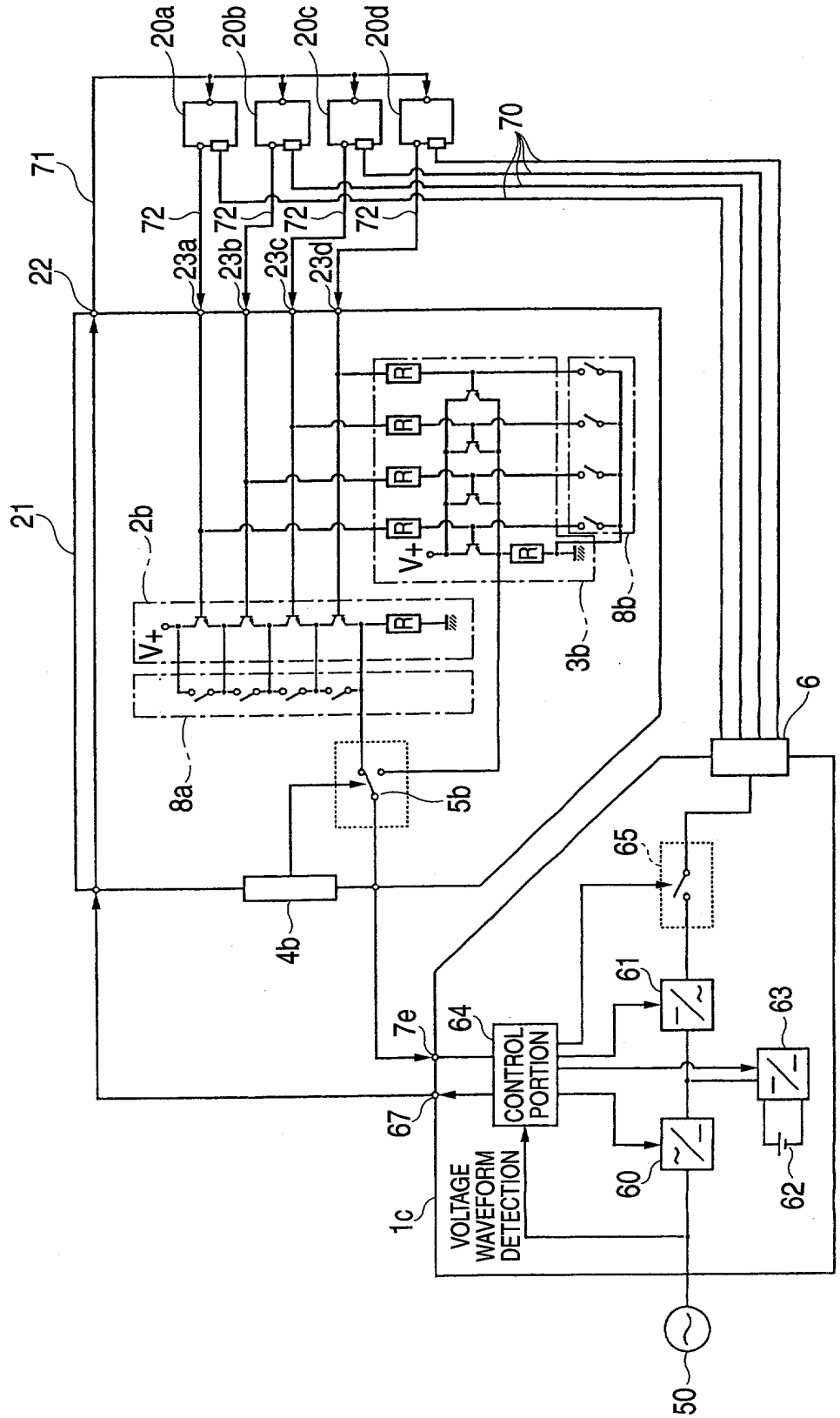

20a
20b
20c
20d
70
71
72
7a
7b
7c
7d
67
6
1b
2b
V+
R
8b
3b
8a
65
61
63
64
CONTROL PORTION
5b
VOLTAGE WAVEFORM DETECTION
60
62
4b
50

FIG. 3


20a
20b
20c
20d
70
71
72
22
23a
23b
23c
23d
21
2b
V+
R
8b
3b
8a
5b
6
4b
65
61
63
7e
64
CONTROL PORTION
67
60
62
1c
VOLTAGE WAVEFORM DETECTION
50

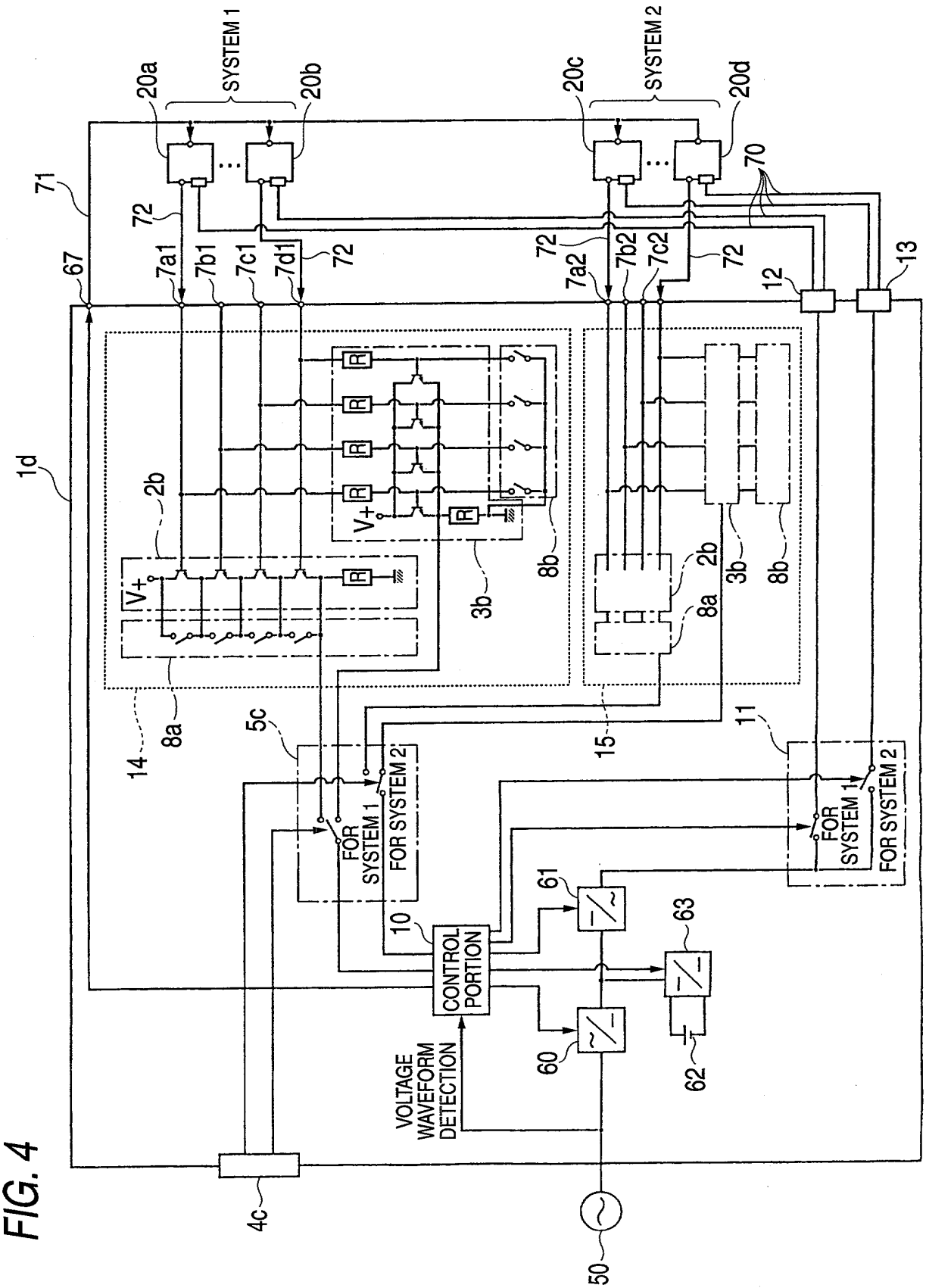

SYSTEM 1
SYSTEM 2
20a
20b
20c
20d
71
72
67
7a1
7b1
7c1
7d1
7a2
7b2
7c2
70
12
13
1d
2b
3b
8b
8a
14
15
5c
11
FOR SYSTEM 1
FOR SYSTEM 2
10
CONTROL PORTION
61
63
60
62
VOLTAGE WAVEFORM DETECTION
4c
50
V+
R

FIG. 4

FIG. 5

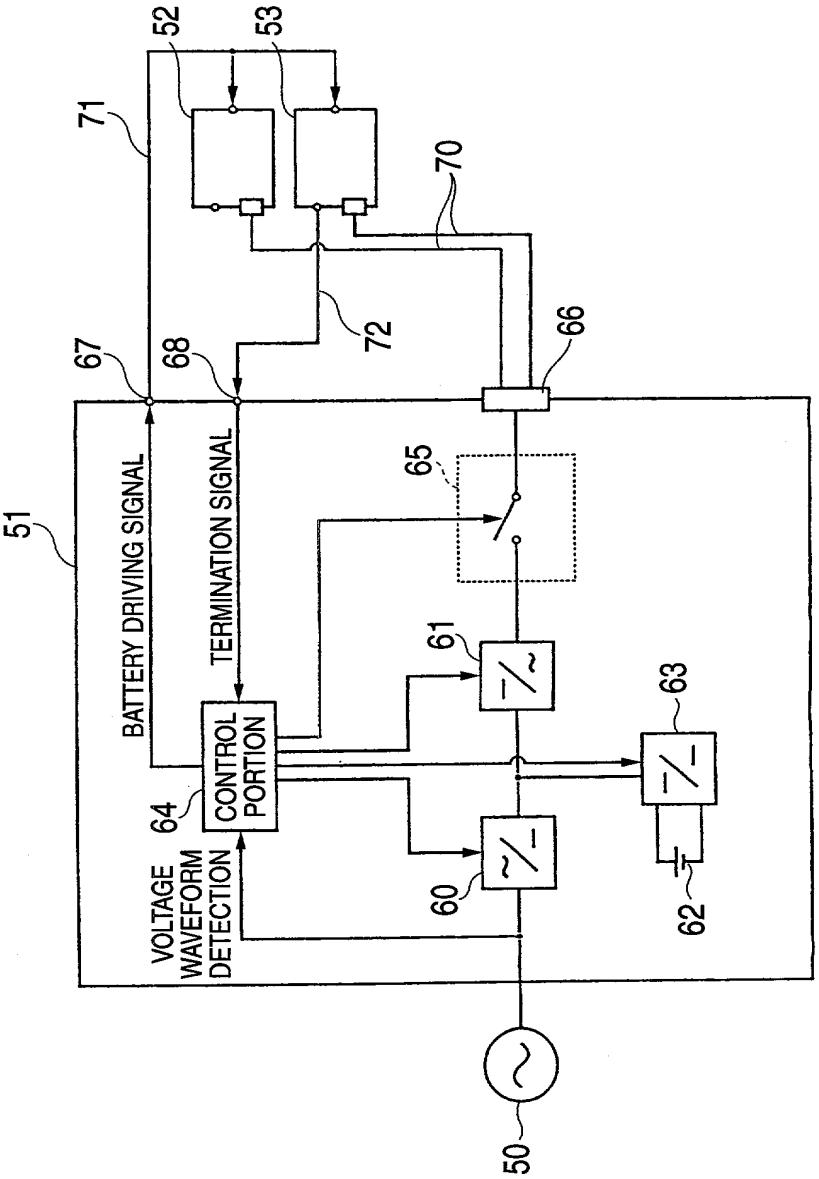
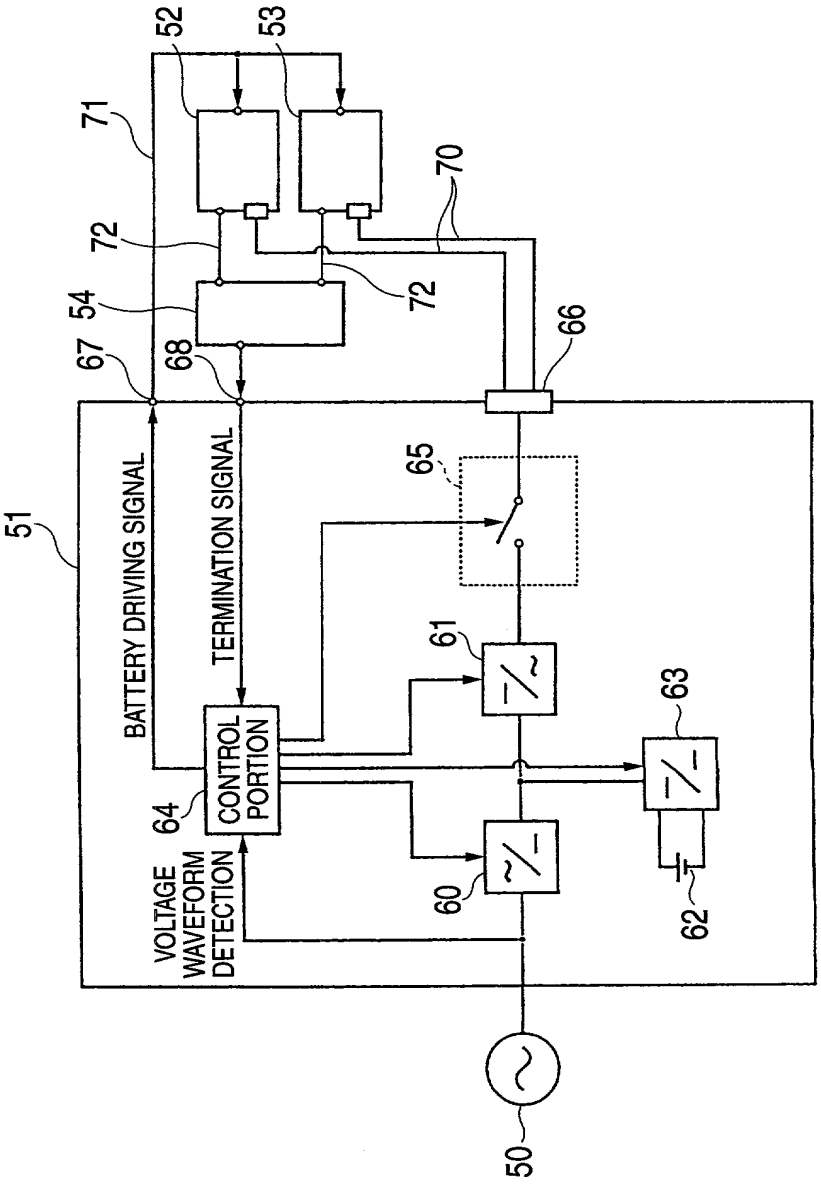

52
53
71
70
72
66
67
68
65
51
BATTERY DRIVING SIGNAL
TERMINATION SIGNAL
61
63
CONTROL PORTION
64
VOLTAGE WAVEFORM DETECTION
60
62
50

FIG. 6


52
53
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72
72
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67
68
66
65
51
BATTERY DRIVING SIGNAL
TERMINATION SIGNAL
61
63
CONTROL PORTION
64
VOLTAGE WAVEFORM DETECTION
60
62
50

Declaration and Power of Attorney for Patent Application
特許出願宣言書および委任状

Japanese Language Declaration

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私は下記発明者として以下の通り宣言します：

As a below named inventor, I hereby declare that:

私の住所、郵送先、および国籍は私の氏名の後に記載された通りです。

My residence, mailing address and citizenship are as stated next to my name.

下記名称の発明に関し請求範囲に記載され特許出願がされている発明内容につき、私が最初、最先かつ唯一の発明者（下記氏名が一つのみの場合）であるか、あるいは最初、最先かつ共同発明者（下記氏名が複数の場合）であると信じます。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

TERMINATION SIGNAL DECIDING DEVICE AND UNINTERRUPTIBLE POWER SUPPLY SYSTEM EQUIPPED WITH THE TERMINATION SIGNAL DECIDING DEVICE

下記項目に×印が付いている場合を除き、上記発明の明細書は本書に添付されます。

the specification of which is attached hereto unless the following box is checked:

☐ 上記発明は米国出願番号あるいはPCT国際出願番号（確認番号＿＿＿＿＿）として＿＿年＿月＿日に出願され、
＿＿年＿月＿日に補正されました（該当する場合）。

☒ was filed on July 17, 2000
as United States Application Number or
PCT International Application Number
PCT/JP00/04797 (Conf. No.＿＿＿＿＿)
and was amended on
＿＿＿＿＿＿＿＿＿＿(if applicable).

私は特許請求範囲を含み上述の補正で補正された前記明細書の内容を検討し、理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

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I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

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私は米国法典第 35 編 119 条(a)-(d)あるいは 365 条(b)に基づき特許あるいは発明者証書の下記外国出願、または 365 条(a)に基づき米国以外の少なくとも 1 ヶ国を指定した下記 PCT 外国出願についての外国優先権をここに主張するとともに、下記項目に×印を付けることにより優先権を主張する出願以前の出願日を有する特許あるいは発明者証書の外国出願あるいは PCT 外国出願を示します。

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below, and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior foreign application(s)
外国での先行出願

Priority Claimed
優先権の主張

(Number) (番号)	(Country) (国名)	(Day/Month/Year Filed) (出願年月日)	Yes 有り	No 無し
			☐	☐
			☐	☐

私は米国法典第35編119条(e)に基づき下記の米国仮特許の利益をここに主張します。

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

(Application No.) (出願番号)	(Filing Date) (出願日)

私は米国法典第 35 編 120 条に基づき下記米国特許出願、あるいは365条(c)に基づき米国を指定する下記PCT国際特許出願の利益をここに主張し、本特許出願内特許請求範囲の各項目の内容が米国法典第 35 編 112条の最初の項に規定される方法により先行米国あるいはPCT国際特許出願で開示されていない限りにおいて連邦規則法典第 37 編 1 条 56 項に定義される特許性に肝要で、先行特許出願の出願日から本特許出願の国内あるいはPCTの出願日までの間に入手された情報について開示義務があることを認めます。

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application No.) (出願番号)	(Filing Date) (出願日)	(Status: patented, pending, abandoned) (状態: 特許成立済、係属中、放棄済)

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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POWER OF ATTORNEY: I hereby appoint all attorneys of SUGHRUE MION, PLLC who are listed under the USPTO Customer Number shown below as my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, recognizing that the specific attorneys listed under that Customer Number may be changed from time to time at the sole discretion of Sughrue Mion, PLLC, and request that all correspondence about the application be addressed to the address filed under the same USPTO Customer Number.

23373

PATENT TRADEMARK OFFICE

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Second inventor's signature 第二発明者の署名 Katsuhiko Ito	Date 日付 March 8, 2002
Residence 住所 Tokyo, Japan JPX	
Citizenship 国籍 Japan	
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